

# 05\_sentiment\_hybrid\_analysis

December 2, 2025

## 1 Hybrid Sentiment Trend

Baseline set to Jan 2019 (comparison\_score = 0) and cumulative hybrid index over time.

```
[1]: from pathlib import Path
BASE_DIR = Path.cwd()
if BASE_DIR.name == 'notebooks':
    BASE_DIR = BASE_DIR.parent

import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

sns.set_style('whitegrid')

hybrid_path = BASE_DIR / 'data' / 'reports' / 'energy' / 'opec' /_
↳ 'opec_hybrid_sentiment.csv'
prices_path = BASE_DIR / 'data' / 'processed' / 'master_monthly_prices.csv'

hybrid = pd.read_csv(hybrid_path)
hybrid['date'] = pd.to_datetime(hybrid['date'])
assert not hybrid['hybrid_index'].isna().any(), 'Hybrid index contains NaNs'
jan_baseline = hybrid.loc[hybrid['date'] == pd.Timestamp('2019-01-31'),_
↳ 'hybrid_index']
print('Jan 2019 baseline hybrid_index:', jan_baseline.iloc[0] if not_
↳ jan_baseline.empty else 'missing')
```

Jan 2019 baseline hybrid\_index: 0.0

```
[2]: prices = pd.read_csv(prices_path)
prices['date'] = pd.to_datetime(prices['Date'])
merged = hybrid.merge(prices[['date', 'PP_EU', 'Brent']], on='date', how='left')
merged.tail()
```

	date	comparison_score	hybrid_index	PP_EU	Brent
78	2025-07-31	0.7	8.3	1445.0	69.07
79	2025-08-31	0.7	9.0	1445.0	67.94
80	2025-09-30	0.3	9.3	1445.0	67.66

81	2025-10-31	0.4	9.7	1445.0	64.09
82	2025-11-30	0.3	10.0	NaN	NaN

```
[3]: fig, axes = plt.subplots(2, 1, figsize=(12, 8), sharex=True)
sns.lineplot(data=merged, x='date', y='hybrid_index', ax=axes[0], color='black', label='Hybrid sentiment index')
axes[0].axhline(0, color='gray', linestyle='--', linewidth=1)
axes[0].set_title('Hybrid sentiment (Jan 2019 baseline)')
axes[0].legend()

sns.lineplot(data=merged, x='date', y='PP_EU', ax=axes[1], label='PP_EU')
sns.lineplot(data=merged, x='date', y='Brent', ax=axes[1], label='Brent')
axes[1].set_title('Polypropylene vs Brent (EUR/t)')
axes[1].legend()
for ax in axes:
    ax.set_ylabel('')
plt.tight_layout()
plt.show()
```

